
PROPULSION DIRECTORATE



Monthly Accomplishment Report May 2001

<u>Contents</u>	<u>Page</u>
<i>Propulsion Directorate Honors Its Own</i>	<i>1</i>
<i>New AFOSR Plasma Flow Initiative</i>	<i>2</i>
<i>Dual-Use Magnetic Bearing Program Completes Phase I Demo</i>	<i>3</i>
<i>Integrated Powerhead Demonstrator Testing Underway</i>	<i>4</i>
<i>Maurice Named SAF/AQ Civilian of the Year</i>	<i>4</i>
<i>Revolutionary Lubricant Development</i>	<i>5</i>
<i>Improving Solid Rocket Motor Insulation</i>	<i>5</i>
<i>Demonstration of an All-Silicon Capillary Pumped Loop</i>	<i>6</i>
<i>Finance Intern Honored by National Society</i>	<i>6</i>
<i>Aging Wiring Diagnostic Tests</i>	<i>7</i>
<i>DUST Flexible FADEC Manufactured</i>	<i>7</i>
<i>Schweickart Wins IEEE Award</i>	<i>8</i>
<i>Dirty Teardown Review of the XTC56/1</i>	<i>8</i>
<i>Space Power Studies Define Critical Technologies</i>	<i>9</i>
<i>IPMA Recognizes Propulsion Directorate Employees</i>	<i>9</i>
<i>SiC-Based Motor Drive</i>	<i>10</i>
<i>Visiting German Scientist Completes Research Task</i>	<i>10</i>
<i>Jones Named March Employee of the Month</i>	<i>10</i>
<i>19th Annual Space Power Workshop</i>	<i>11</i>
<i>Maldonado Named April Employee of the Month</i>	<i>11</i>

PROPULSION DIRECTORATE HONORS ITS OWN: In May 2001, the Propulsion Directorate held separate ceremonies at Wright-Patterson AFB (PR-East) and Edwards AFB (PR-West) to honor the achievements of the past year. These ceremonies were held on 1 May 2001 and 3 May 2001, respectively. The following awards were given (shown in the order of presentation):

<u>Award</u>	<u>Winner</u>	<u>Runner-Up</u>
Engineer of the Year	Dr. Russell L. Spyker	Dr. William Hargus
Scientist of the Year	Dr. James R. Gord	Dr. William W. Copenhagen
Program Manager of the Year (Technical)	Dr. Shawn Phillips	Mr. Brian G. Hager
Program Manager of the Year (Non- Technical)	Mr. T. J. Turner	Sqn Ldr Richard Friend
Technical Support of the Year (S&E)	Mr. Gregory L. Rhoads	Mr. Reginald Ching
Technical Support of the Year (Non- S&E)	Mr. Phillip Counts	Mr. Michael J. Davis Mr. Carl Williams
Leadership Award	Maj Joe McNamee	Dr. Thomas A. Jackson
Secretary of the Year	Ms. Sally A. Martin	Ms. Nadine Smith
Supervisor of the Year	Mr. Joseph A. Weimer	Mr. Norman D. Poti
Mission Support of the Year	Ms. Veronica Norman Ms. Colleen M. Robinson	-
Senior Mission Support of the Year	Ms. Jane Hendricks	Ms. Laurie Regazzi
Outstanding Mission Support Team of the Year	Edwards Financial Management Team	PR East Environmental Safety and Occupational Health (ESOH) Team
Outstanding Technical Publication	Dr. James D. Scofield & Dr. Bish Ganguly Ms. Michelle DeRose & Dr. Mario Fajardo	-
Technology Transfer Award	Dr. Paul N. Barnes	Mr. John E. Lueke & Mr. Mark D. Reitz
Airman of the Year	SrA Jason Brock	-
NCO of the Year	MSgt John Titus	-
David A. Hawkins Award (CGO of the Year)	Capt Anthony M. Cerminaro	-

The ceremonies culminated with the presentation of the Propulsion Directorate's most prestigious awards. For these awards, which are listed below, there were no runner-ups:

<u>Award</u>	<u>Winner</u>
E. C. Simpson Award	Monopropellant Research and Development Team (led by Dr. Tom Hawkins)
Director's Trophy	Solid Boost Demo Team (Capt Kerri Parent, Mr. Stuart Bridges, & Mr. Daniel Schwartz)
Don Ross Award	Mr. John Clark
S. D. Heron Award	Maj Jeffrey P. Bons, PhD & Dr. Rolf Sondergaard

Congratulations to all the winners and nominees. (J. Pearce, AFRL/PRO (UTC), (937) 255-5451)

Want more information?

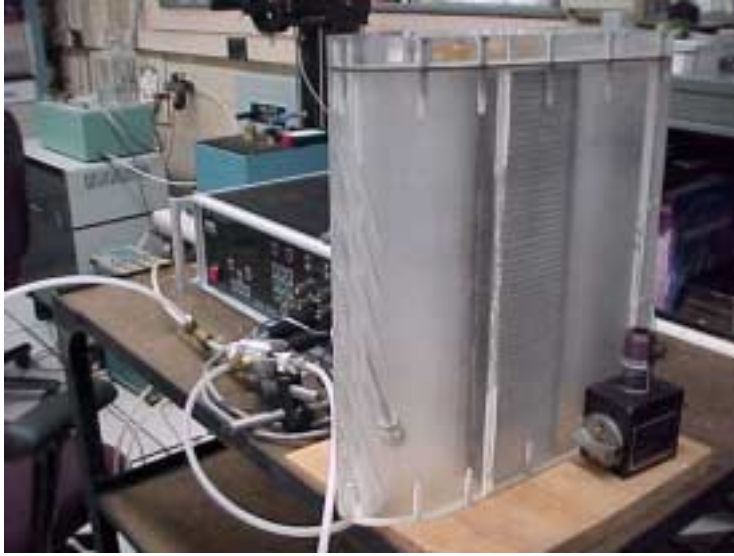
- ❖ A Propulsion Directorate Press Release on the awards ceremony at Edwards AFB is available by clicking [here](#). Follow the *Press Releases* link to the story titled "Lab Honors Annual Propulsion Winners."

NEW AFOSR PLASMA FLOW INITIATIVE: A new AFOSR Plasma Flow Initiative was kicked-off at the Propulsion Directorate on 16-17 April 2001. As part of this initiative, a new three-year program for Turbine Flow Control will commence this year. A number of other investigations are planned as part of AFOSR programs. The next generation of low pressure turbine (LPT) blades will be investigated in PR's LPT Flow Control Cascade. New LPT blades will be installed that will allow removal of every other blade and will maintain periodicity while improved instrumentation will allow doubling the resolution and accuracy of discharge coefficient measurements. First and third stage rotor blades for the Global Hawk LPT will be



These next generation LPT blades will be investigated in the LPT Flow Control Cascade

baselined at their operating conditions and then dimpled to see how much of the loss in performance due to low Reynolds number can be recovered. In other experiments, the pulsing of film cooling flows will be investigated to determine if such flows can be utilized to reduce the amount of film cooling air. Duty cycles down to 1% are being investigated and compared to continuous film flows. Further testing will examine the performance of various leading edge configurations using liquid crystal and IR techniques. (R. Rivir, AFRL/PRTT, (937) 255-2744)



Investigating methods to reduce film cooling air requirements

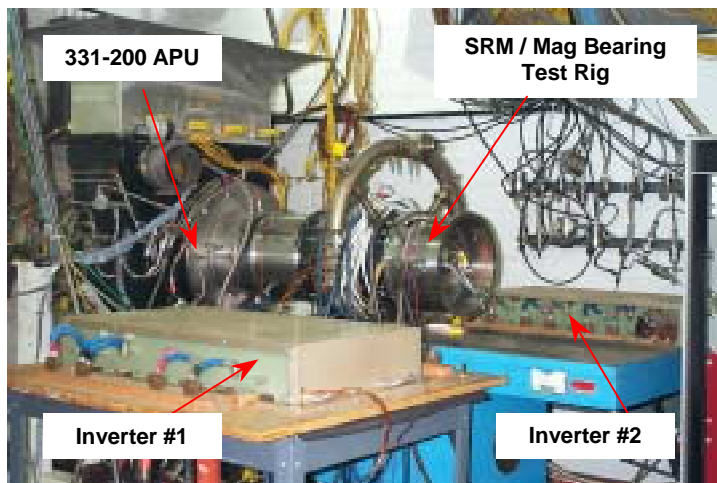


Leading edge configurations

DUAL-USE MAGNETIC BEARING PROGRAM COMPLETES PHASE I DEMO: On 27 April 2001, Honeywell successfully demonstrated an auxiliary power unit (APU) with a switched-reluctance machine (SRM) on magnetic bearings as part of a Propulsion Directorate Dual-Use S&T Program. The demonstration unit was cycled through a number of APU starts, where the SRM motors the APU up to light-off speed. Once successful combustion is established, the APU accelerates up to the commanded operating speed, and the SRM can then be switched into power generation mode. For the demonstration, Honeywell connected one of its commercial 331-200 APUs to the SRM by a quill shaft arrangement. At an APU speed of 38 krpm, the SRM produced 50 kW at 270 VDC. In the follow-on phases to this effort, Honeywell will produce flight-weight magnetic bearings and a bearing controller. This new hardware will be integrated into an APU, and the full system, levitated on magnetic bearings, will be tested for system stability and overall performance. (E. Gregory, AFRL/PRPG, (937) 255-6241)



Honeywell conceptual IPU



IPU test rig and hardware

INTEGRATED POWERHEAD DEMONSTRATOR TESTING UNDERWAY: The first two Integrated Powerhead Demonstrator (IPD) LOX Turbopump cold flow tests were successfully completed in May 2001 at NASA's Stennis Space Center. These are the first tests of this US designed oxygen turbopump. The IPD Program has two main technical goals. The first goal is to increase turbine life by using a full flow cycle staged combustion design. This is achieved by lowering turbine inlet temperatures through the use of all propellants as turbine drive fluids. The second goal is to increase bearing lifetime and reduce wear by incorporating hydrostatic bearing



IPD LOX turbopump cold flow testing

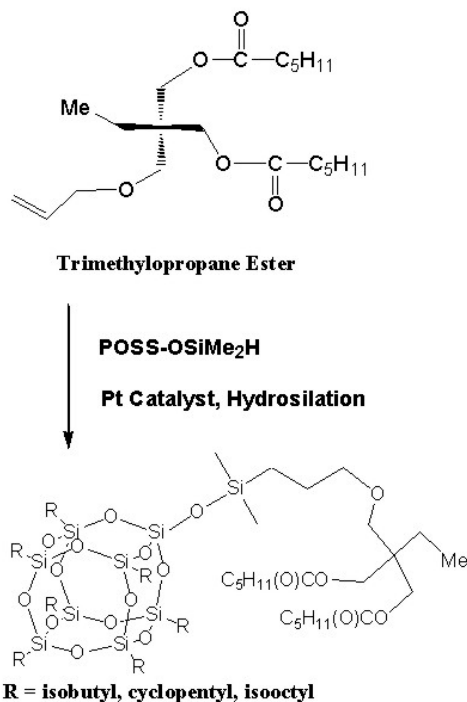
technology in both the hydrogen and oxygen turbopumps. The IPD Program contributes to Integrated High Payoff Rocket Propulsion Technology (IHRPT) goals of doubling cryogenic booster thrust-to-weight, achieving Mean-Time-Between-Overhauls of 100 missions, and reducing hardware costs by 35%. It further provides critical propulsion technologies for the Air Force Space Operations Vehicle (SOV) concept and NASA's 2nd Generation Reusable Launch Vehicle (RLV). IPD testing is continuing. (Capt J. Thornburg, AFRL/PRSE, (661) 275-5320)

MAURICE NAMED SAF/AQ CIVILIAN OF THE YEAR: Dr. Lourdes Maurice was recently honored by the Assistant Secretary of the Air Force for Acquisition (SAF/AQ). At an award ceremony held on 19 May 2001, Dr. Maurice was named SAF/AQ's Civilian of the Year for 2000. Dr. Maurice, a Propulsion Directorate alumnus currently assigned to AFOSR, serves as the Deputy for Propulsion at SAF/AQRT. She has done an outstanding job serving as the Program Element Monitor (PEM) for the two largest and most controversial areas in the Air Force Science and Technology (S&T) portfolio: Basic Research and Aerospace Propulsion. These programs represent nearly 30% of the overall AF S&T investment (approximately \$435 million annually) and are frequently the center of attention at the highest levels of the DoD and Congress. Dr. Maurice also serves as the PEM for the congressionally directed Dual Use S&T Program. Her professionalism, leadership, and enthusiasm have had a tremendous positive impact on the US scientific knowledge base and the advancement of propulsion technologies. (J. Pearce, AFRL/PRO (UTC), (937) 255-5451)



Dr. Lourdes Maurice

REVOLUTIONARY LUBRICANT DEVELOPMENT: The Propulsion Materials Applications Branch (AFRL/PRSM) at Edwards AFB and the Mechanical Systems Branch (AFRL/PRTM) at Wright-Patterson AFB have been collaborating for the last two years on development of a revolutionary lubricant. This lubricant is based on the highly versatile PRSM-developed polyhedral oligomeric silsesquioxanes (POSS) material. To date, candidate compounds were not liquid over a large enough temperature range to satisfy requirements for engine lubrication. A recent breakthrough by a PRSM chemist, Dr. Rusty Blanski, has apparently taken a large step towards bridging the POSS lubricant requirements gap. Dr. Blanski has successfully synthesized a compound composed of one of PRTM's most highly stable ester lubricant molecules (trimethylolpropane ester) with a POSS cage molecule. The new compound has the potential to provide the liquidity and additive solubility properties needed for successful lubrication. Also, this type of molecule should have much higher thermal stability than conventional ester lubricant compounds, thereby providing a potential new lubricant for application in turbine engines and other high temperature machinery. PRTM is eagerly awaiting synthesis of a large enough quantity of the new substance to start preliminary lubricant screening tests. (R. Wright, AFRL/PRTM, (937) 255-5568)



POSS-Ester lubricant synthesis

IMPROVING SOLID ROCKET MOTOR INSULATION: The Propulsion Directorate's Polymer Working Group at Edwards AFB has an ongoing project in collaboration with Pratt & Whitney's Chemical Systems Division (CSD) to improve solid rocket motor (SRM) insulation. In this project, SRM insulation incorporating POSS (polyhedral oligomeric silsesquioxanes) has been successfully developed and tested. The incorporation of POSS into SRM insulation has been

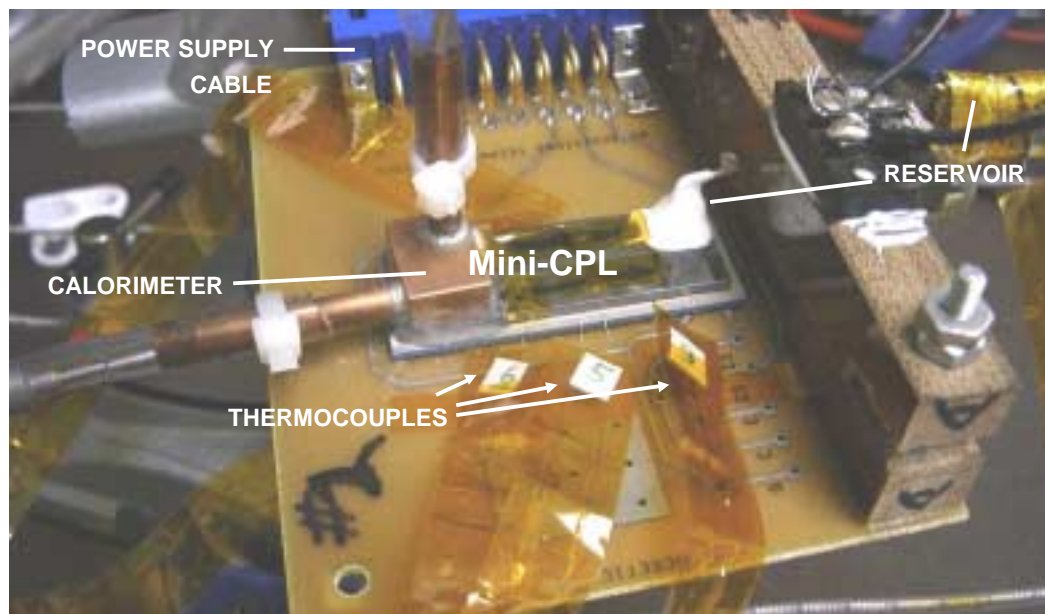


POSS can reduce ablation of solid rocket motor insulation

shown to reduce ablation in tests with both 4-lb and 40-lb propellant charges. Recently, six new POSS materials were tested in CSD's 40-lb aluminum propellant ITM motor. Three of the samples showed improvement over the baseline, with one particular POSS sample showing dramatic improvements in ablation reduction (almost no change in insulation thickness) in all except the high Mach region close to the nozzle. Preliminary analysis of the sample showed that aluminum in the

propellant reacted with the silica formed from the POSS resulting in further protection of the insulation. The preliminary test results were so impressive in terms of insulation reduction that CSD wants to expand potential POSS-insulation programs, which already include the Phase III SRM demo, to incorporate the Phase II demonstrator and other proprietary programs. The Polymer Working Group is currently performing cost-analysis for increasing in-house testing. (S. Phillips, AFRL/PRSM, (661) 275-5416)

DEMONSTRATION OF AN ALL-SILICON CAPILLARY PUMPED LOOP: An all-silicon, planar mini-Capillary Pumped Loop (CPL) was recently demonstrated using an Insulated Gate Bipolar Transistor (IGBT)-type power switch as a heat source. Researchers from the Propulsion Directorate (AFRL/PR) and the University of California-Berkeley (UCB) designed the silicon mini-CPL, which is a thermal management concept to integrally cool power switching electronics. The mini-CPL was fabricated at Berkeley, and final assembly, filling, and integration into a power switch electronics package was conducted at Harris Corp in Melbourne, Florida, and at PR. Initial demonstration testing was performed at Harris Corp by researchers from PR, Harris Corp, and Berkeley, and the mini-CPL performed as expected, demonstrating an approximate 15°C reduction in the operating temperature of the IGBT. Future activities will investigate operational parameters and active temperature control using a reservoir mounted off of the mini-CPL evaporator. Hybrid designs using ceramics and silicon are also being investigated. (K. Yerkes, AFRL/PRPS, (937) 255-6241)



Power switch electronics package prior to insulation and testing

FINANCE INTERN HONORED BY NATIONAL SOCIETY: Ms. Colleen Robinson of the Propulsion Directorate's Financial Management Division (AFRL/PRF) was recently honored by the Aviation Chapter, American Society of Military Comptrollers (ASMC). Ms. Robinson was named the ASMC Comptroller Intern of the Year for 2000. Although an intern, Ms. Robinson's exemplary efforts made a significant impact on the PRF mission. She developed a methodology to reconcile payroll between the Air Force General Ledger System, the Job Order Cost



Ms. Colleen Robinson

Accounting System (JOCAS), and the Defense Civilian Payroll System, which resulted in less management reserve needed for contingencies. She is also the lead financial analyst for the Aircraft Propulsion Subsystem Integration (APSI) and Advanced Turbine Engine Gas Generator (ATEGG) programs, responsible for \$49 million in budget execution. Largely due to her efforts, these programs were consistently 30% above obligation and expenditure goals. Ms. Robinson was also honored as a co-winner of the Propulsion Directorate's Mission Support of the Year Award in a ceremony on 1 May 2001. (M. Novitski, AFRL/PRF, (937) 255-6130)

AGING WIRING DIAGNOSTIC TESTS: Major Robert Ware, a reservist with the Materials & Manufacturing Directorate (AFRL/ML), conducted a series of tests with Propulsion Directorate personnel to determine if a proposed wiring inspection system is injurious to adjacent initially undamaged wires. The proposed wiring inspection system detects faults by energizing individual wires in a wiring bundle to 1500 VDC and recording gaseous discharges. To aid in discharge activity, the test is typically run in a helium atmosphere. A wire, with a cut through the insulation to the wire conductor, was positioned above an undamaged wire on an aluminum ground plane. Polyimide and hybrid polyimide and polytetrafluoroethylene insulated wires were tested, with exposure up to 10,000 discharges. After exposure, the wires were inspected using a scanning electron microscope, a micro-Fourier transform infrared spectrometer, and an energy dispersive spectrometer. Initial visual observations show that at a 1-Hz discharge rate, the exposed wire appears undamaged after 1,000 discharges. After 10,000 discharges, some wires showed surface damage. The spark discharges contained 18 mJ of energy. Typical spark waveforms were 60 A peak and 400 nanoseconds wide. Since the proposed insulation tester would discharge a damaged wire only a few times during a diagnostic test, the results at 1,000 discharges are encouraging. (J. Horwath & D. Schweickart, AFRL/PRPG, (937) 255-9190 and Maj R. Ware, AFRL/MLLP, (937) 656-9153)



Wire inspection test setup

DUST FLEXIBLE FADEC MANUFACTURED: Manufacturing has been completed on components for the Dual-Use S&T (DUST) Flexible Full Authority Digital Engine Control (FADEC). The items manufactured are the MPC-555 I/O Processor and Actuator Interface Module (AIM) printed circuit boards and the FADEC chassis. These components will be

integrated to form an innovative flexible FADEC based on smaller common form factor modules that will reduce the development, production, and maintenance costs of FADECs for gas turbine engines. The payoffs of this program are primarily cost-related and include benefits in development or nonrecurring engineering (NRE) cost, unit or acquisition cost, and maintenance cost. NRE costs are reduced through the use of standard, reusable modules that enable rapid, low-cost FADEC prototyping, testing, and certification. The use of commercial electronic parts and circuit boards, a high-speed, industry-standard data bus, and economies of scale from using these modules on multiple engines will reduce unit cost. Module maintenance cost will be lower because of lower replacement part costs, the potential for this approach to result in “throw away” modules, and the ability to address obsolescence by replacing small inexpensive modules instead of the large custom circuit boards used in current FADECs. (D. Tasch, AFRL/PRTA, (937) 255-6690)

SCHWEICKART WINS IEEE AWARD: Dr. Dan Schweickart of the Propulsion Directorate’s Power Division (AFRL/PRP) received the Harrell V. Noble Award from the Dayton Section of the Institute of Electrical and Electronic Engineers (IEEE) on 21 April 2001. Dr. Noble was the Technical Director of the Wright Air Development Center’s Electronics Technology Laboratory and a lifelong member of IEEE. After his retirement, the Dayton Section of IEEE established this endowed award in his honor. Since 1974, the Dayton Section has competitively selected and given this award annually in recognition of significant contributions in research, development, or applications of electron devices, or in teaching or management of these same devices. This year, the award was presented to Dr. Schweickart for his contributions to the high voltage technology community, which include research investigations on the electron transport and charge growth in gas mixtures. These investigations are related to the basic understanding of polymeric insulation degradation in sub-atmospheric environments and subsequent breakdown of gas mixtures at low pressures. (D. Schweickart, AFRL/PRPG, (937) 255-9189)



Dr. Schweickart (right) receives the 2001 Noble Award

Want more information?

- ❖ An article about this award is available on the IEEE Dayton Section website by clicking [here](#).

DIRTY TEARDOWN REVIEW OF THE XTC56/1: A review was held on 13-14 March 2001 at the Honeywell facility in Phoenix, Arizona, to get a first look at all the hardware that was tested during the running of the XTC56/1 at Honeywell’s San Tan test facility. No significant damage

was seen that would preclude the assembly of the second build, XTC56/2. There were, however, some cracks seen in the high pressure compressor (HPC) diffuser. Honeywell will perform a Fluorescent Penetrant Inspection on the diffuser to help determine the cause of the cracks. A significant carbon build-up was observed in the combustor, especially in the 9-to-12 o'clock quadrant. All the fuel nozzles and both halves of the manifold were flow checked to see if there was a significant difference in flow for each of the quadrants, and no significant variations were found. Samples of the fuel were analyzed and found to be within JP-8 specifications. Analyses of some of the carbon samples show a particular carbon structure formation that indicates gas phase pyrolysis of liquid fuel droplets. Honeywell's explanation is that these droplets were formed because of a high fuel-to-air ratio, a low T_3 , and low corrected flow conditions in the combustor. Only slight damage to one of the Lycolite combustor panels was noted. A clean review is planned for 5 June 2001 at Honeywell. Additionally, Honeywell will discuss the analysis of all the test data, and at that time, the team will decide how to proceed with the XTC56/2. (M. Huffman, AFRL/PRTP, (937) 255-2278)

SPACE POWER STUDIES DEFINE CRITICAL TECHNOLOGIES: Final reviews were held on 10-11 April 2001 at Wright Patterson AFB to help define the critical technologies for baseload and pulsed power systems for space. These studies identified promising electric power system (EPS) technologies in the areas of power generation, energy storage, power conditioning and distribution, EPS architectures, and subsystems integration. These activities were performed by Boeing Phantom Works and Lockheed Martin Astronautics. A top-down approach was taken in these activities, where system level goals were determined, EPS objectives were derived, technical challenges that are preventing the objectives from being achieved were identified, and various approaches were proposed to overcome those technical challenges. The critical technologies identified will be evaluated and a Program Research and Development Announcement (PRDA) will be released to work these key areas. (G. Fronista, AFRL/PRPE, (937) 255-9392)

IPMA RECOGNIZES PROPULSION DIRECTORATE EMPLOYEES: Ms. Laurie Regazzi and Ms. Janice Poland of the Propulsion Directorate's Business Services Branch (AFRL/PROB) were recently honored by the International Personnel Management Association (IPMA). The Dayton Area IPMA, which represents all Federal Employees in the Dayton area, held its annual awards banquet on 3 May 2001. At this banquet, Ms. Regazzi was named the runner-up in the Specialist (Administrative/Technical/General) category. As a Management Analyst, Ms. Regazzi is responsible for research order contract management, O&M Budget oversight, and



Ms. Laurie Regazzi



Ms. Janice Poland

JOCAS II/DCPS implementation, interface, and system management for the Propulsion Directorate. She was also recently honored as the runner-up for the Propulsion Directorate's Senior Mission Support of the Year award. Ms. Poland was a finalist for the IPMA award in the Human Resources Management category. She serves as a Management Analyst responsible for overseeing human resource (HR) matters for the Propulsion Directorate. In this position, she provides management and administrative support in HR functional areas, including manpower, civilian and military personnel, Laboratory Personnel Demonstration Project (Lab Demo), awards, training, ethics, and the Equal Opportunity Program. Both Ms. Regazzi and Ms. Poland are well deserving of this recognition. (S. Steltz, AFRL/PROB, (937) 255-1889)

SiC-BASED MOTOR DRIVE: Mechatronic Systems LLC has successfully completed the design, fabrication, and testing of a 270VDC, 1 kW silicon carbide (SiC) inverter under a Propulsion Directorate Phase I SBIR Program. The SiC inverter (JFETs and diodes) functioned properly during tests, including current regulation under resistive and inductive loads. However, improvements on the SiC JFETs are needed in terms of reduction of forward voltage drop under dynamic switching conditions, increasing the reverse blocking voltage, and metallized coatings of the die for high temperature die-attach process. The design, fabrication, and test results for Phase I provide the needed lessons learned to proceed to a Phase II SBIR technology maturation effort. Increases in power level (9 kW) and operating temperature (250°C) are also desired technical goals for Phase II. Furthermore, Mechatronic Systems LLC will develop a breadboard 42VDC four-phase unit for automotive brake applications. (M. Maldonado, AFRL/PRPE, (937) 255-9392)

VISITING GERMAN SCIENTIST COMPLETES RESEARCH TASK: Mr. Peter Fendel of the University of Essen (Germany), who arrived under a short-term visit program, has successfully completed his research task for the Propulsion Directorate's Power Division (AFRL/PRP). His task was to measure spatial variation of electric field vectors in a high reduced electric field plasma device using Rydberg-state Stark spectroscopy and to relate this measurement with the corresponding electron kinetics from the metastable atom density measurement. Mr. Fendel's research results revealed some features of this high reduced electric field plasma device, which are significantly different from a volume-dominated glow discharge operating at the same current density. These measurements are applicable to the short-pulsed high voltage plasma devices such as high voltage switch and plasma ion immersion devices. Mr. Fendel's collaborative research at the Propulsion Directorate was sponsored by the International Education Office of the Ohio State University. Mr. Fendel will join the Max-Planck Institute (Munich, Germany) for further graduate research studies in May 2001. (B. Ganguly, AFRL/PRPE, (937) 255-2923)

JONES NAMED MARCH EMPLOYEE OF THE MONTH: Ms. Temeca Jones of the Propulsion Directorate's Financial Management Division (AFRL/PRF) has been named PR's Employee of the Month for March 2001 in the Staff Support/Technician category. As a Financial Analyst, Ms. Jones performs a broad range of financial management and cost functions ensuring that program fiscal execution is in legal and regulatory compliance. Her crucial leadership and oversight of supported programs have resulted in excellent financial reviews and no loss of funds due to poor performance. She improved business practices by revamping the way Activity Based Costing (ABC) data was recorded, extrapolated, and reported to PR management and AFRL HQ.

Her efforts led to significant manpower savings for PRF. She created, revised, and updated the Turbine Engine Division's budget execution summary incorporating S&T goal analysis and program status ensuring accurate and timely data for decision making. She was also instrumental in identifying a projected cost overrun of almost \$3 million prior to it being reported by the contractor. This provided the early insight to assist the program manager in making key decisions on the contract. Ms. Jones is the "go to" person for additional duties, serving as the Propulsion Directorate focal point for numerous activities and acting as the PRF Intranet webmaster. Her outstanding efforts were further recognized by her selection as an AFRL nominee (for WPAFB) for the Black Employment Program (BEP) award (Category I, Non-supervisory). (M. Novitski, AFRL/PRF, (937) 255-6130)



Ms. Temeca Jones

19th ANNUAL SPACE POWER WORKSHOP: The 19th Annual Space Power Workshop was held 2-6 April 2001 in Redondo Beach, California. The workshop is jointly sponsored by The Aerospace Corporation, the Air Force Research Laboratory, and the Air Force Space and Missiles Center. The goal of the Space Power Workshop is to provide an informal, unclassified, international forum for the exchange of ideas and information on space power. The theme this year was "Commonality in Space and Terrestrial Power." Formal sessions focused on power systems architecture, power management and distribution (PMAD), power generation, energy storage, and program experience. In addition to the sessions, three workshops on power generation, energy storage, and PMAD were held on the afternoon of 4 April 2001. The workshops provided an open forum to discuss relevant issues pertaining to the specific technical fields. Mr. Greg Fronista of the Propulsion Directorate served as the Technical Co-Chairman for the workshop, and several other members of the Power Division (AFRL/PRP) were involved as session organizers or presenters. (G. Fronista, AFRL/PRPE, (937) 255-9392)



Mr. Miguel Maldonado

MALDONADO NAMED APRIL EMPLOYEE OF THE MONTH: Mr. Miguel A. Maldonado of the Propulsion Directorate's Electrical Technology and Plasma Physics Branch (AFRL/PRPE) has been named PR's Employee of the Month for April 2001 in the Scientist, Engineer, or Supervisor category. Mr. Maldonado was recognized for his exceptional efforts in developing jointly funded programs to develop high temperature, high power density motor drives and Arc Fault Circuit Breakers (AFCBs). Mr. Maldonado demonstrated exceptional insight and team building skills in initiating a jointly funded SBIR Phase II

Program with VA, ML, Delphi Automotive, and Mechatronic Systems. This program will develop a prototype 270VDC SiC-based Motor Drive for flight controls and a 42VDC motor drive breadboard for automotive electric brake systems. This will lead to the development of high temperature, high power motor drive technologies for both Air Force and commercial applications. As a member of the Aging Wire IPT, Mr. Maldonado submitted a proposal for the development of an AFCB for fighter aircraft applications. Current circuit breaker technology cannot reliably identify arc fault conditions, and arc faults have been identified as a leading cause of aircraft fires and catastrophic failures. His work with the Aging Aircraft SPO will lead to the development of an AFCB for fighter aircraft applications. Mr. Maldonado also completed a program with the Northrop Grumman Corp to define the power system requirements for a directed energy weapon (DEW) system on the B-2 bomber. He is the focal point for 2002 Dual-Use topics and proposals and is the Power Division's 6.3 program manager. (J. Weimer, AFRL/PRPE, (937) 255-6235)